08-624,564

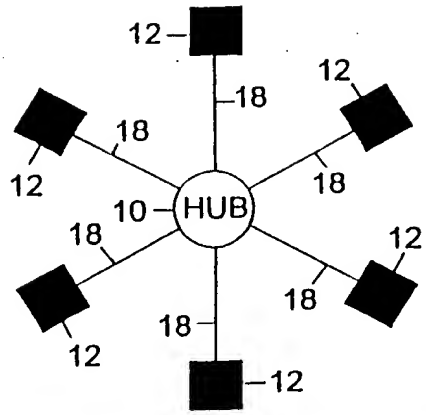


Fig. 1
Prior Art

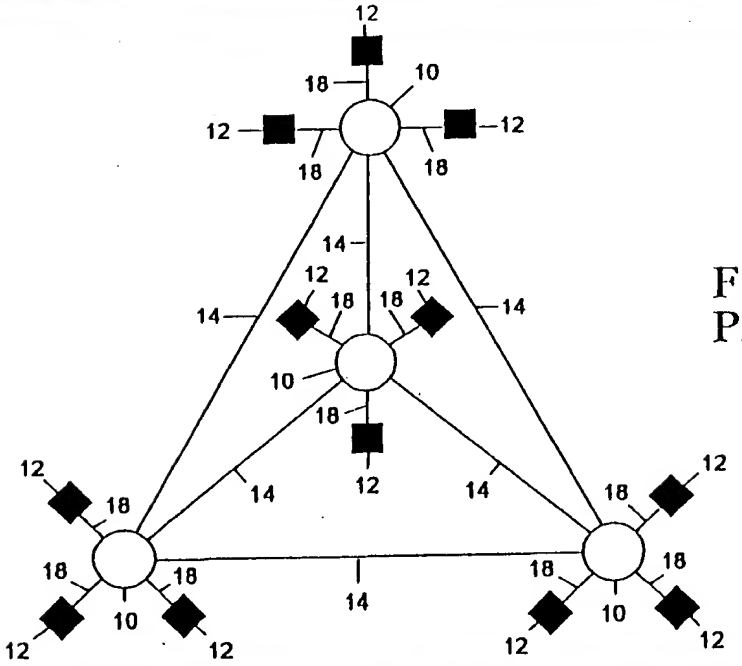


Fig. 2
Prior Art

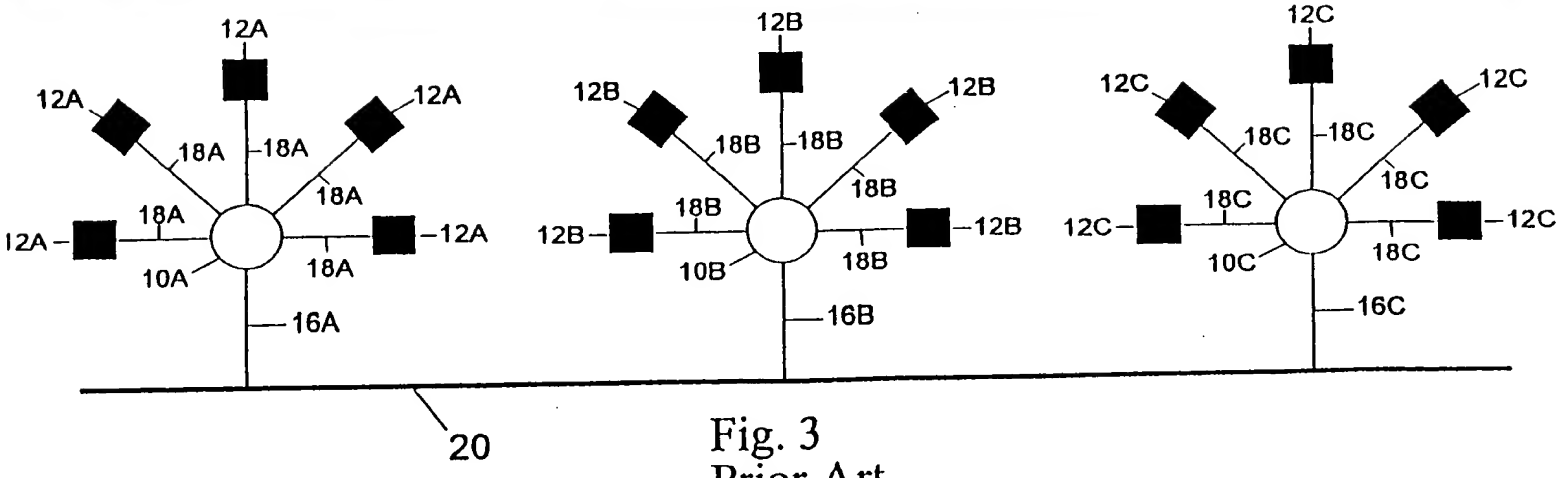


Fig. 3
Prior Art

08-624,564

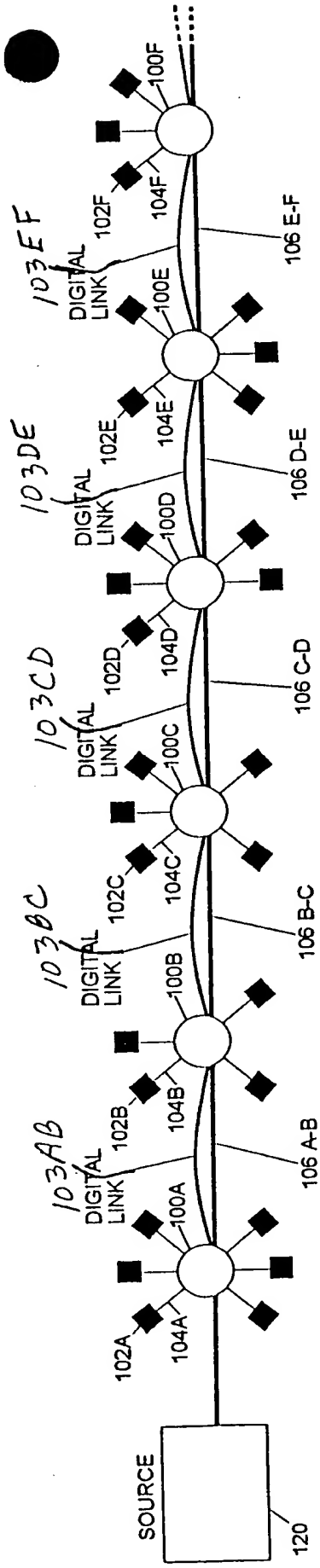
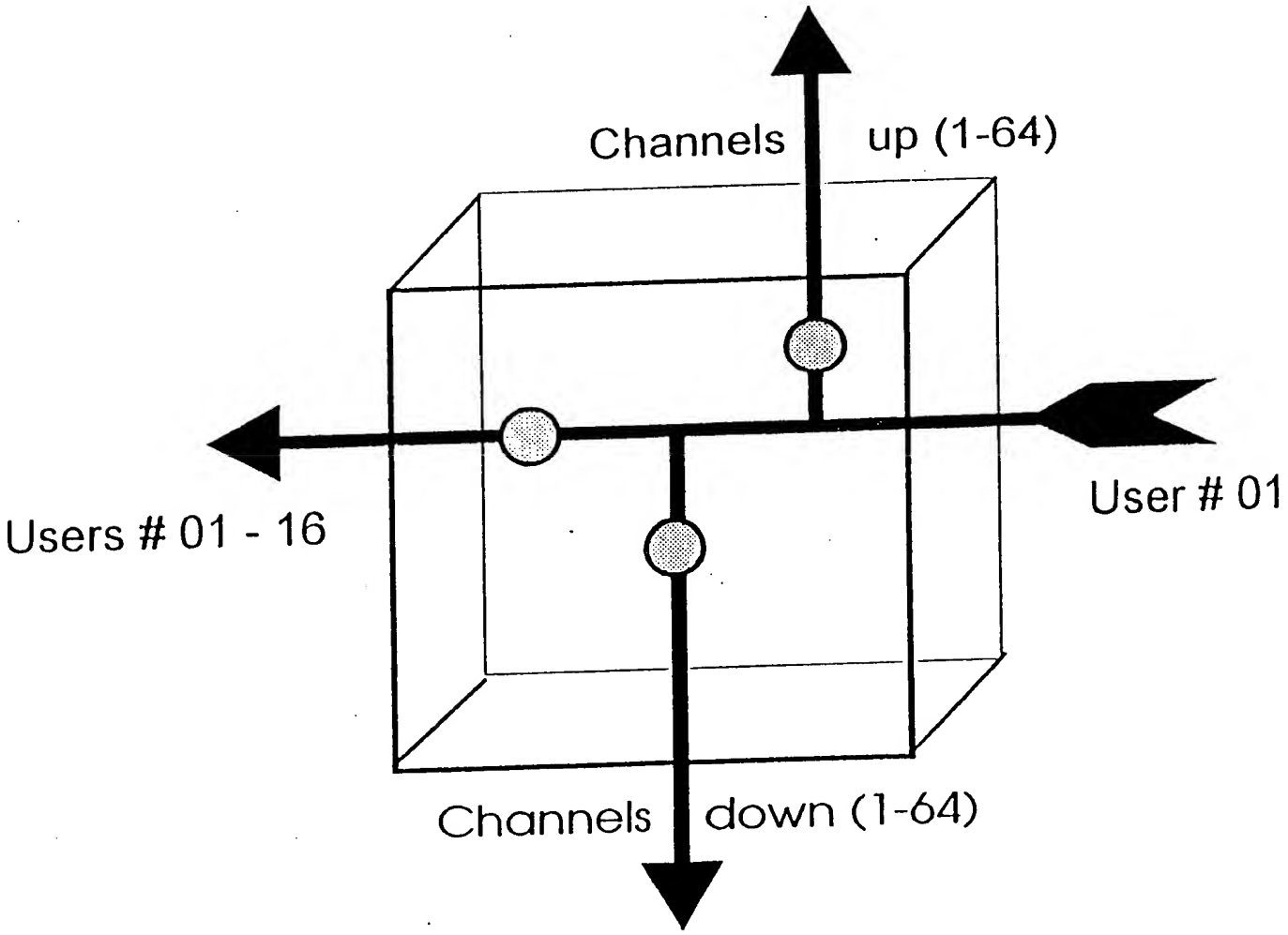


Fig. 4

Principle of Channel Segmentation (Transmit mode - Tx)



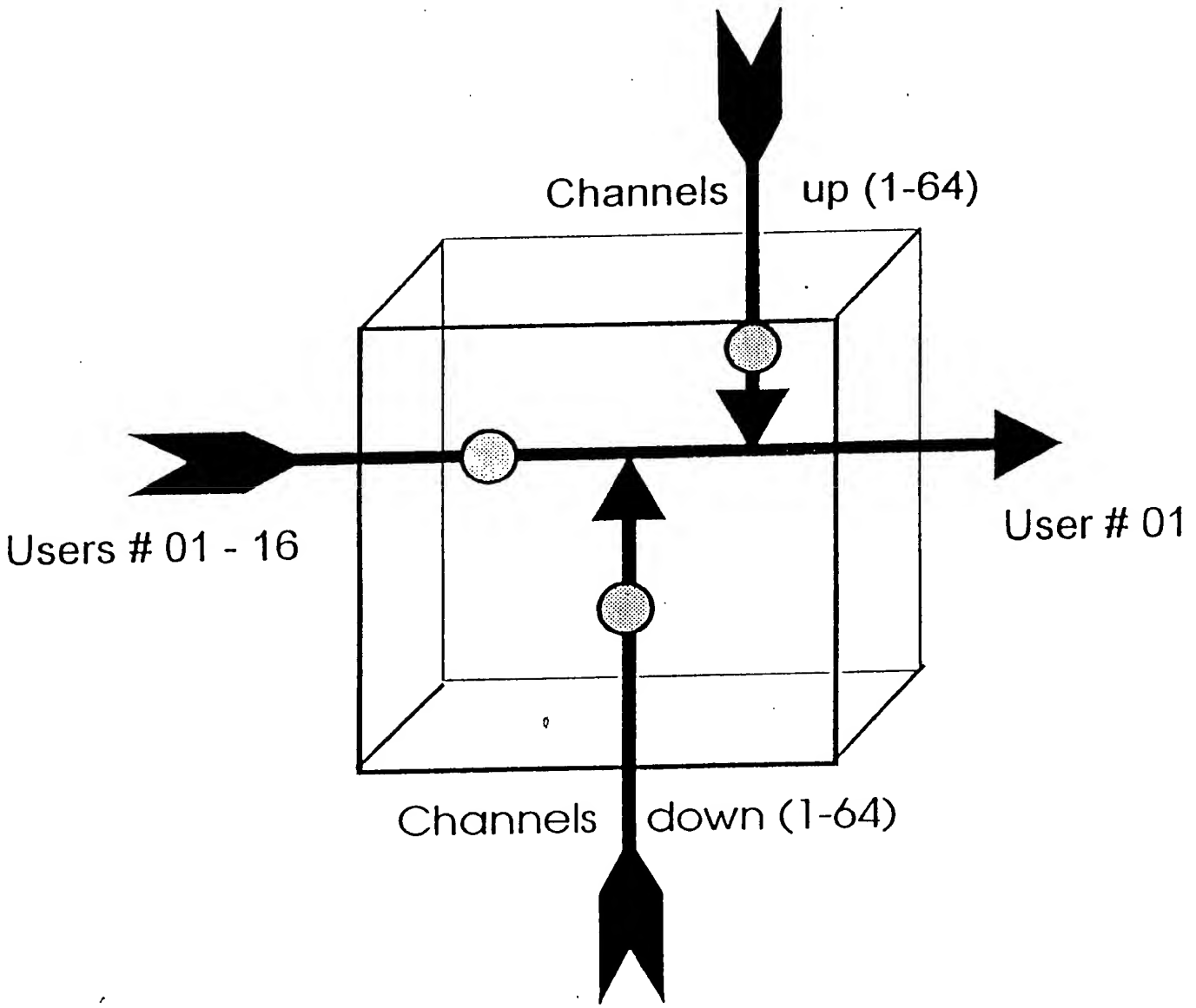
Digitally controlled analog switch (on/off)

Signal path may be interrupted to limit distribution over network at 3 points per crosspoint switch (up, down, across)

Fig. 5

08-624,564

Principle of Channel Segmentation (Receive mode - Rx)



Digitally controlled analog switch (on/off)

Signal path may be interrupted to limit distribution over network at 3 points per crosspoint switch (up, down, across)

Fig. 6

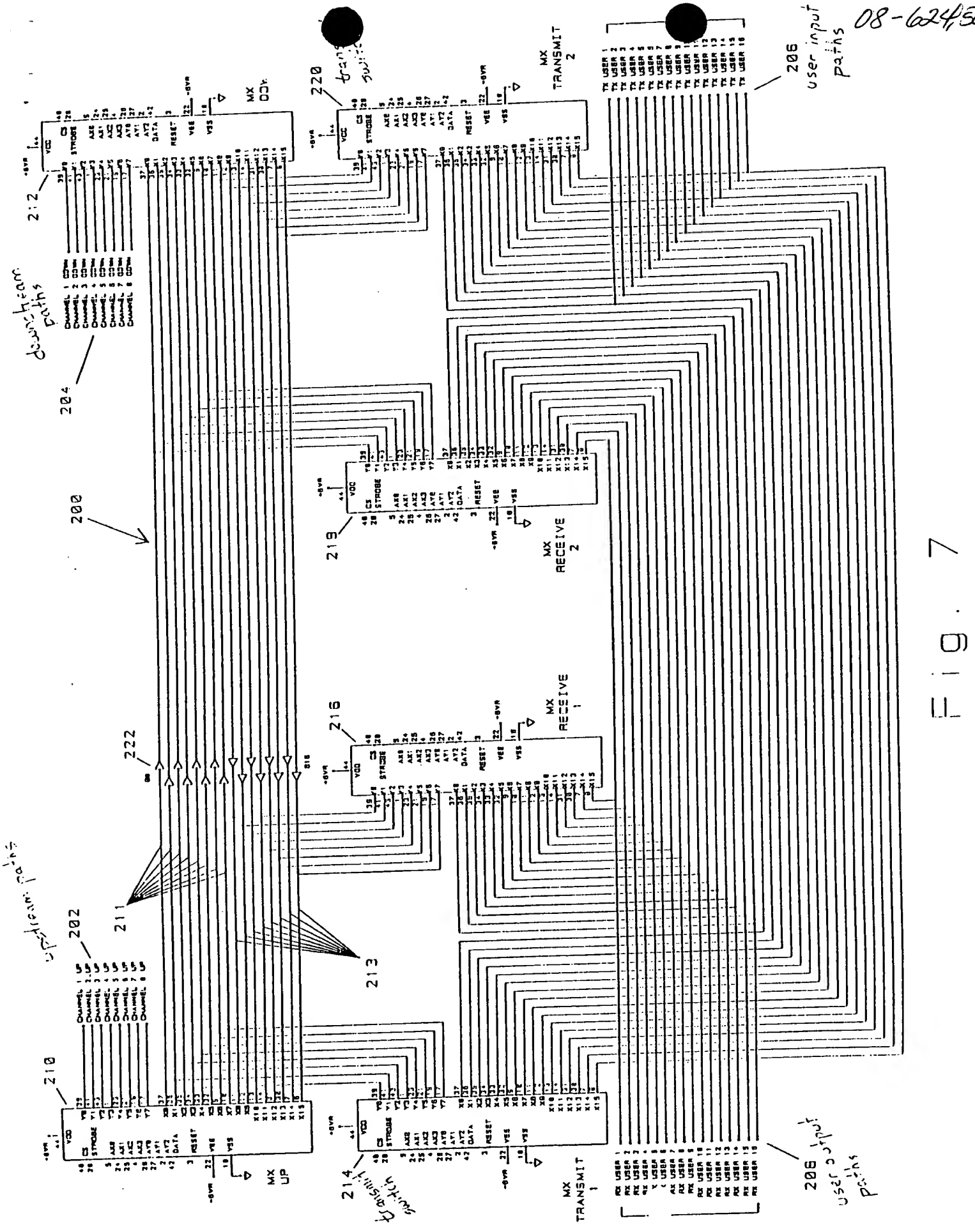

08-624,564
206
user input paths
MX TRANSMIT 2
220
MX RECEIVE 2
219
200
MX RECEIVE 1
216
222
202
211
213
MX UP
210
214
MX TRANSMIT 1
206
user output paths
204
downstream paths

Fig. 7

08-624,504

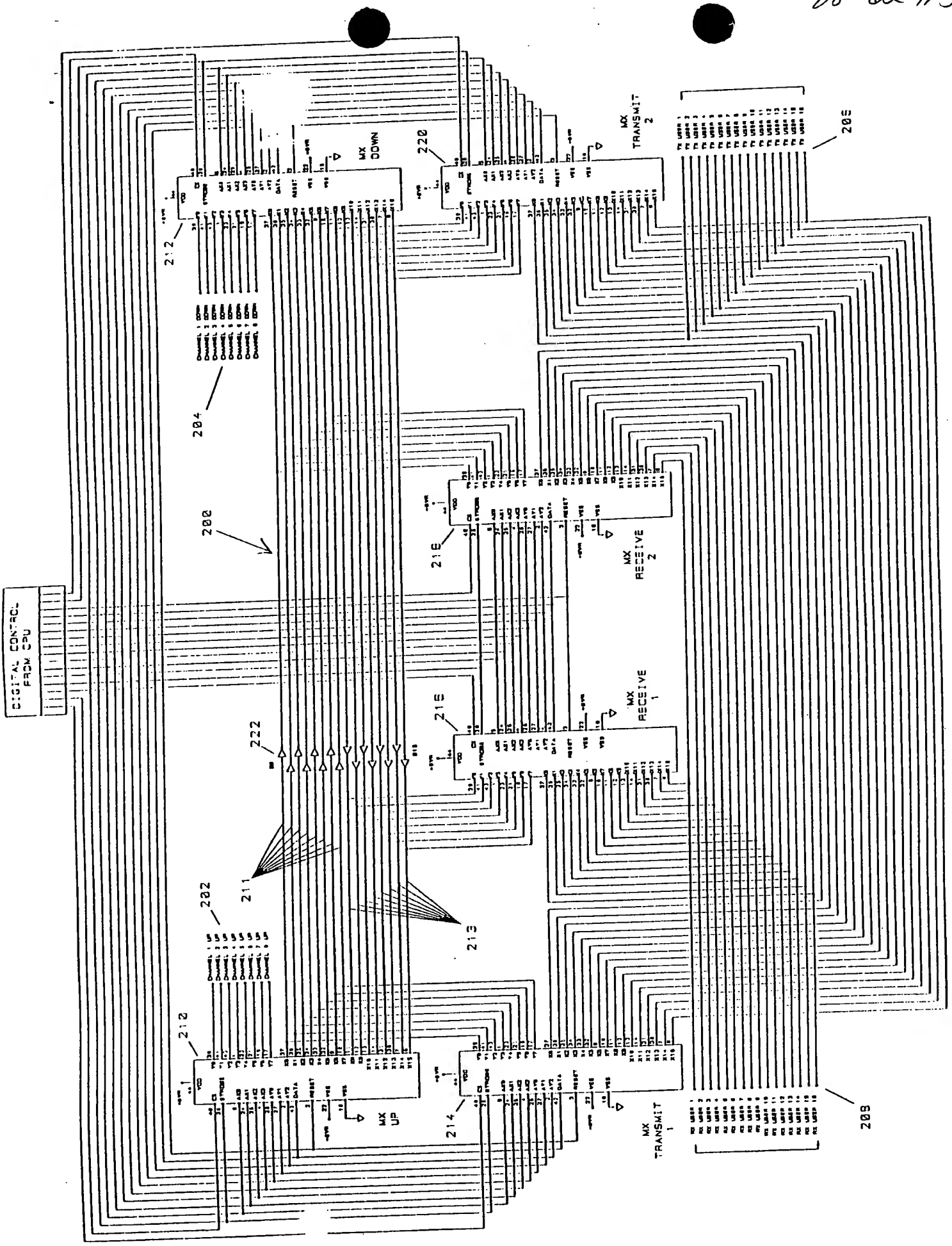


Fig. 7A

08-624864

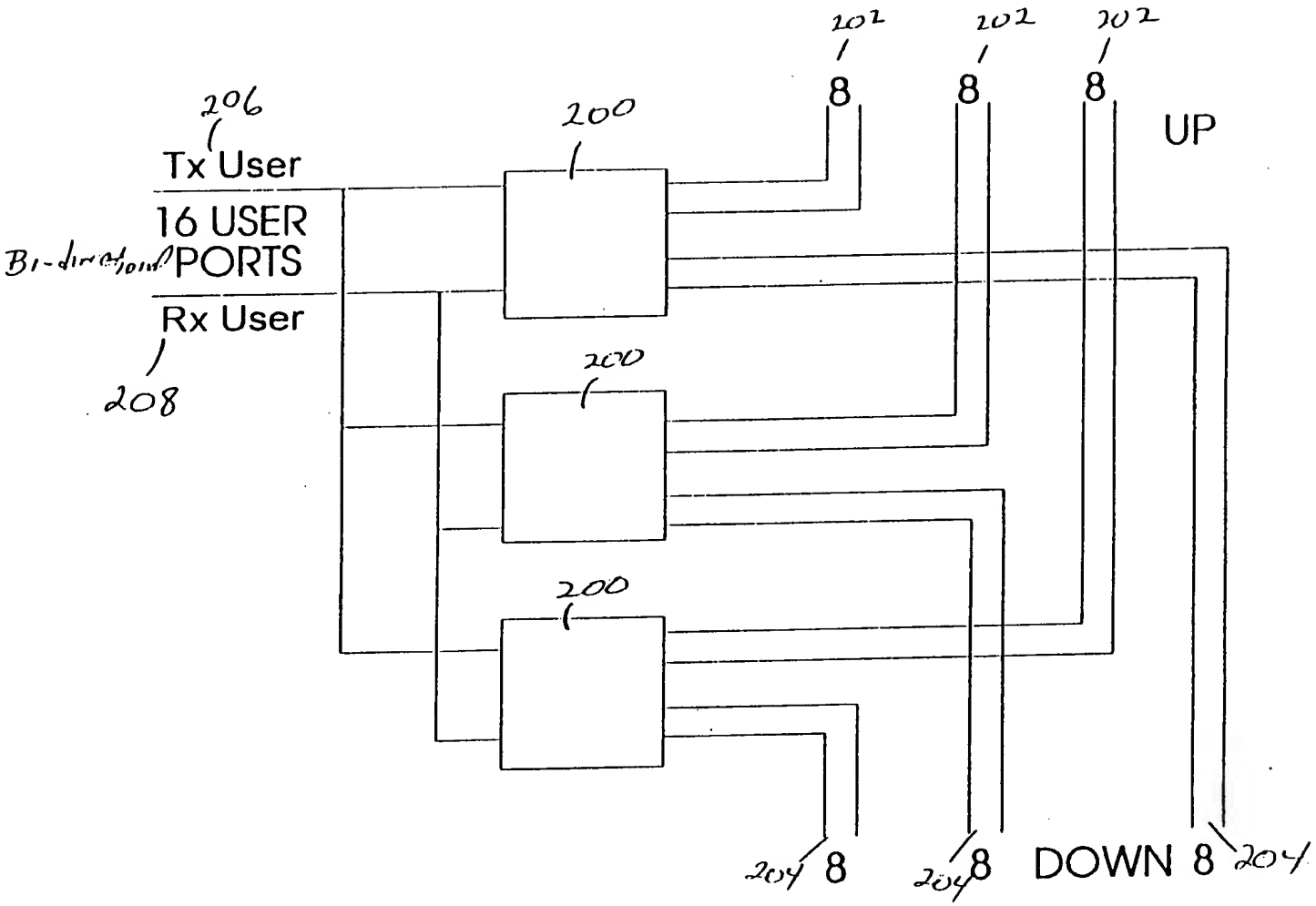


Fig. 8

TWISTED PAIR TERMINATION MODULE
TRANSMISSION

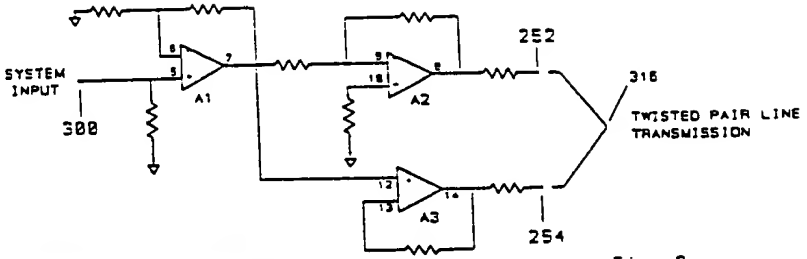


Fig. 9

TWISTED PAIR TERMINATION MODULE
RECEPTION

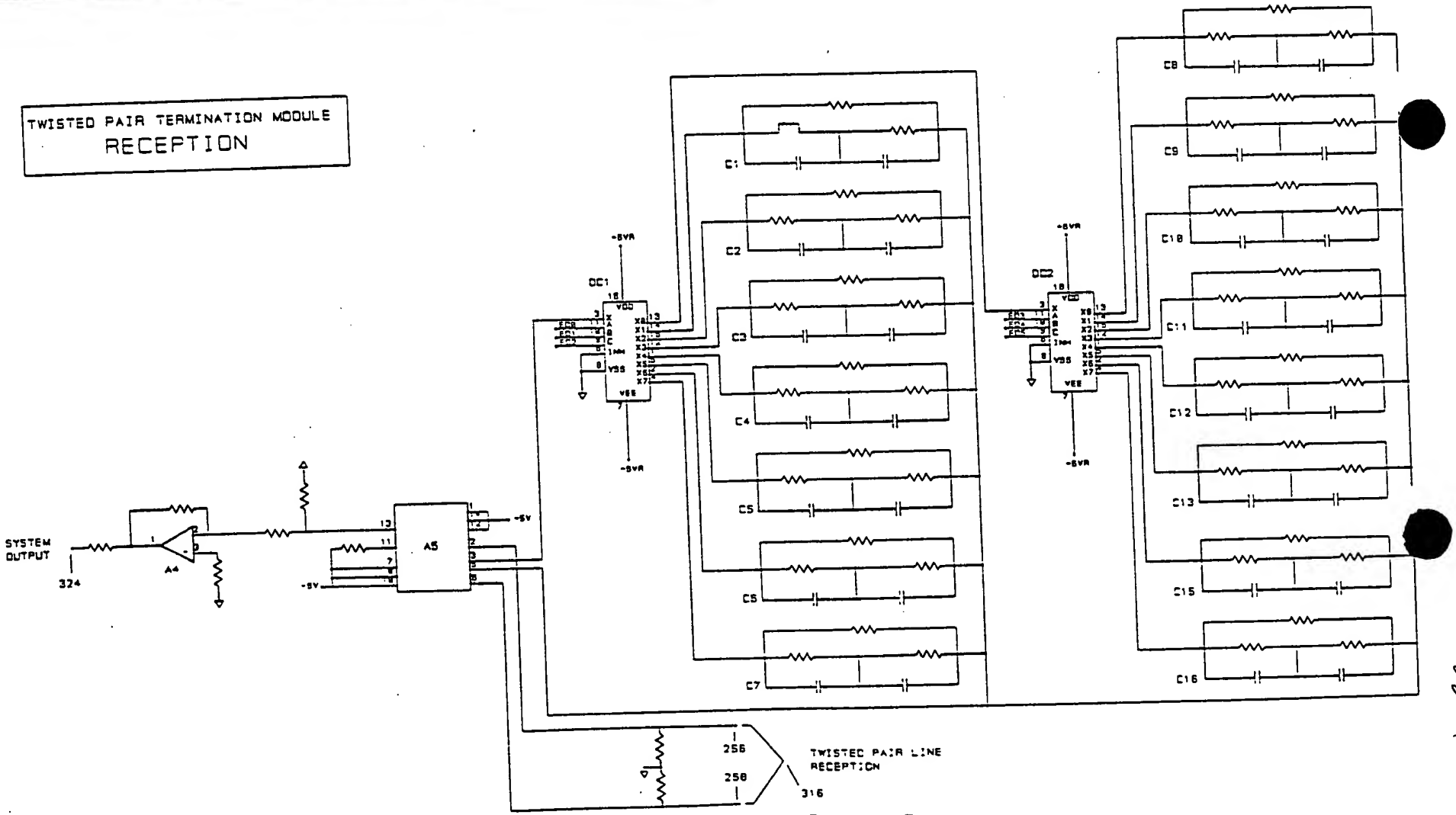


Fig. 10

08-6245264

08-6245804

Twisted Pair Termination Module

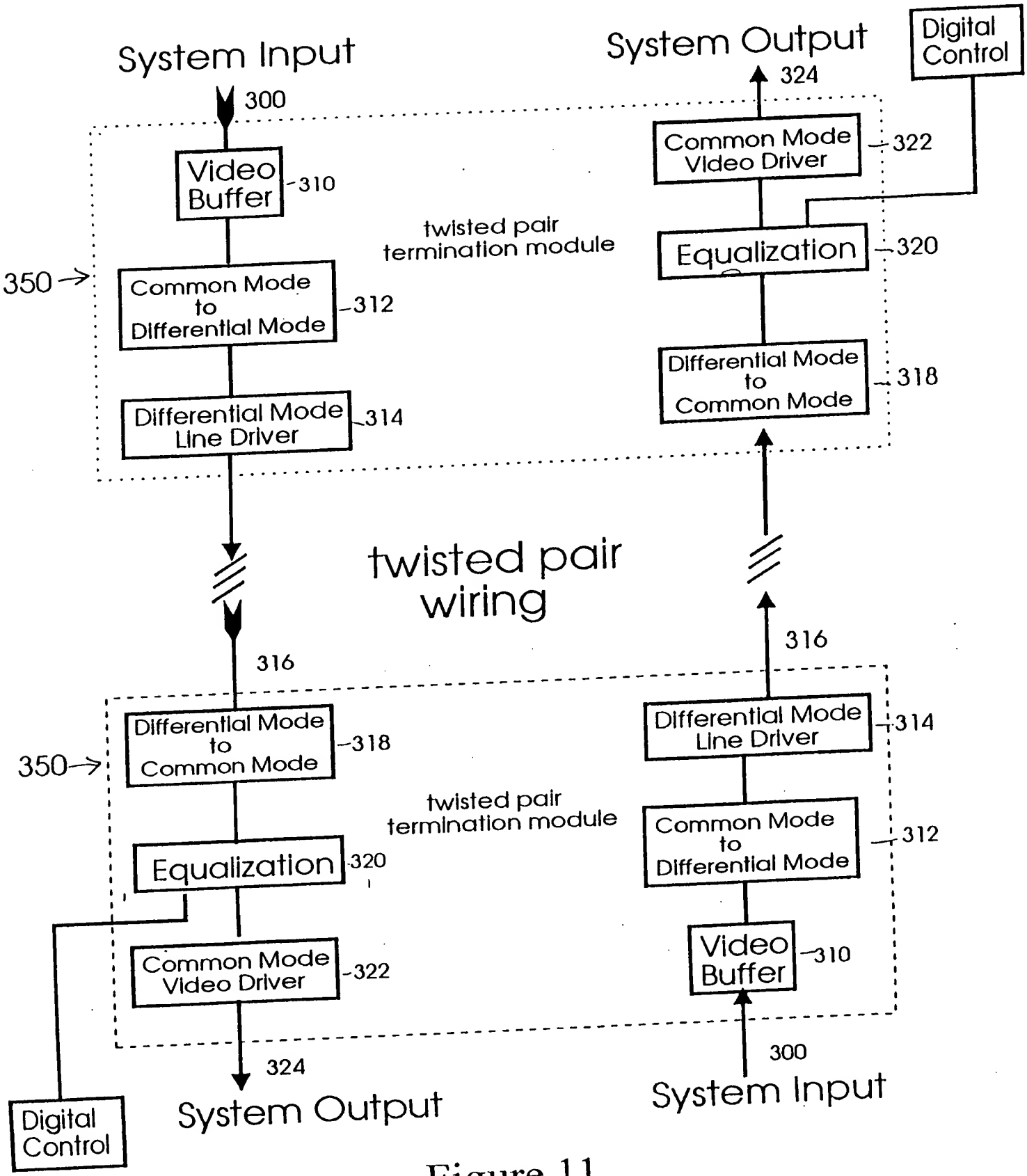


Figure 11

08-~~662~~
624,564

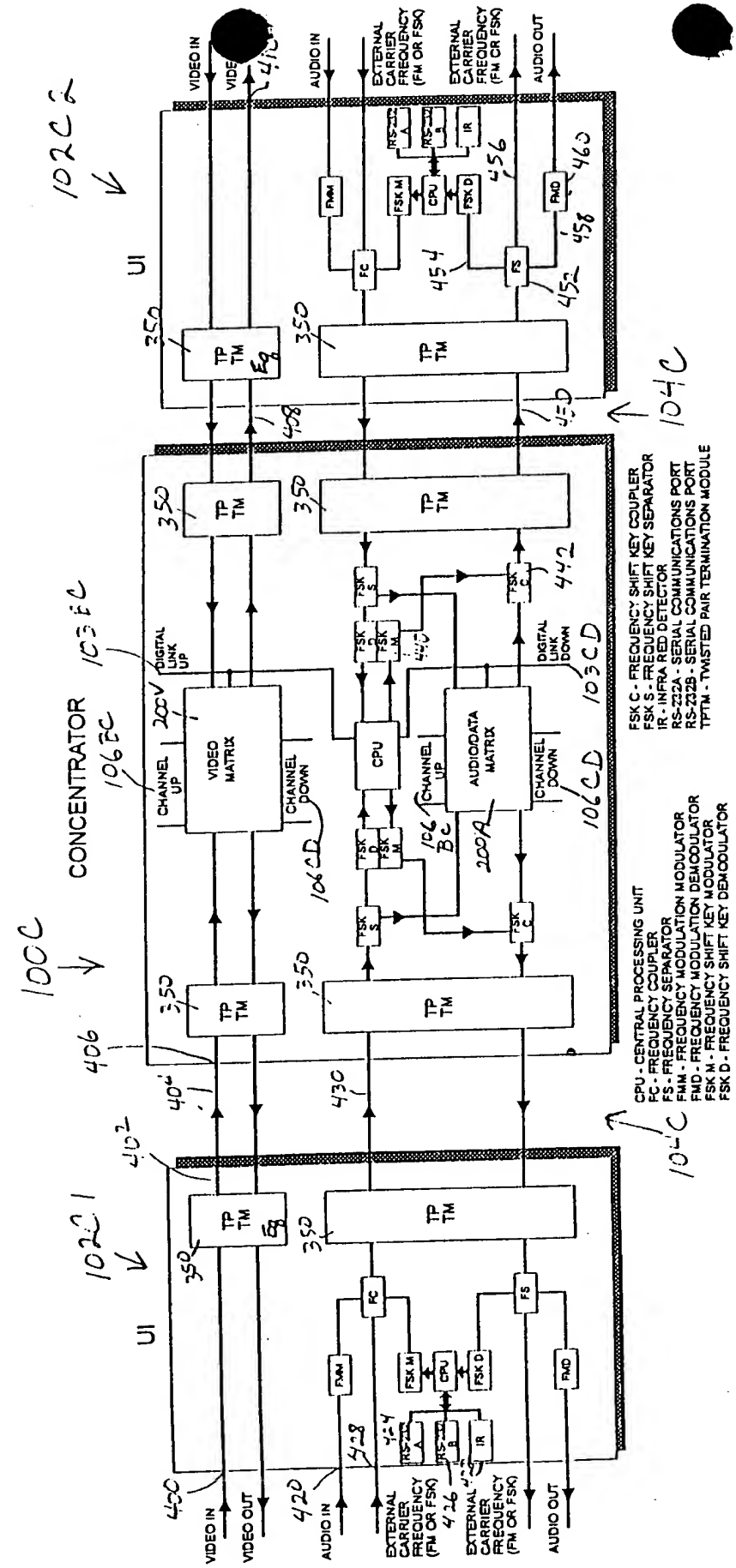


Fig. 12

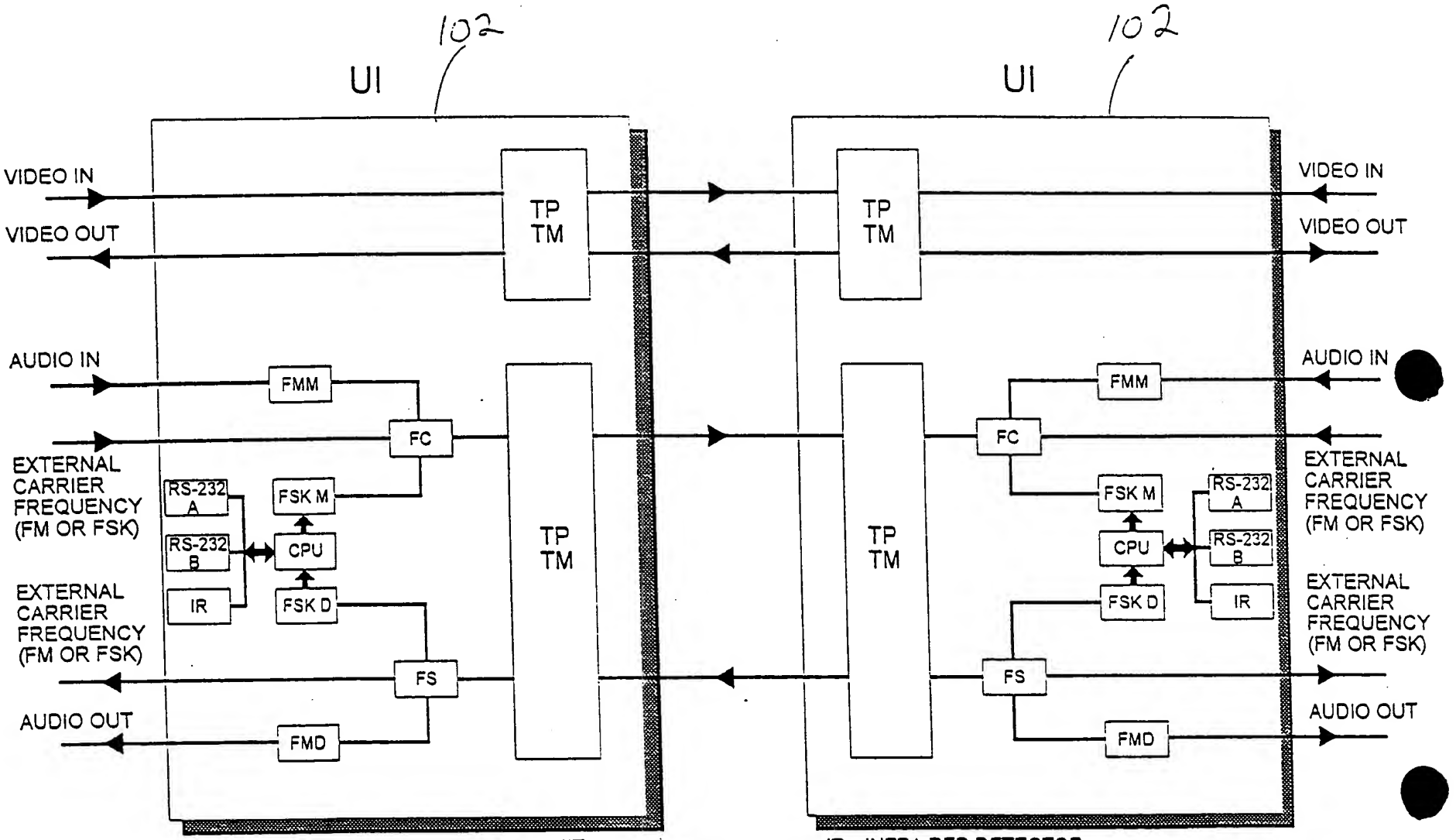
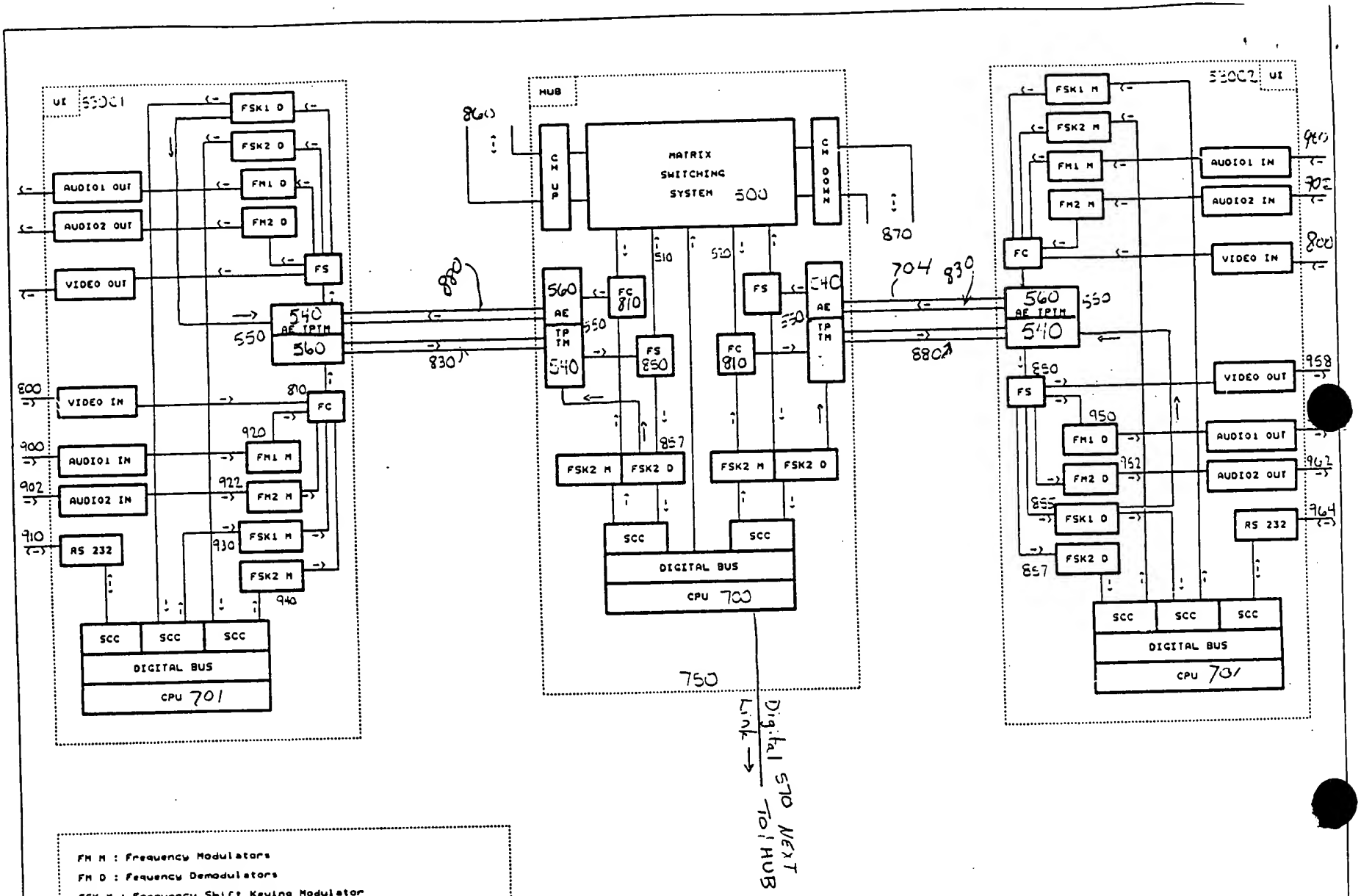


Fig. 13

08-6244.504



FM M : Frequency Modulators
FM D : Fequency Demodulators
FSK M : Frequency Shift Keying Modulator
FSK D : Fregency Shift Keying Demodulator
FC : Frequency coupler
FS : Frequency Separator
DIGITAL BUS : CPU Interface with Digital Devices
SCC : Serial Communication Controler
AE TPTM : Auto-Equalized Twisted Pair Termination Module
RS 232 : Low Speed Serial Communication Port
CH UP : UP Channel Backbone Port
CH DOWN : Down Channel Backbone Port

FIGURE 14

08-0247

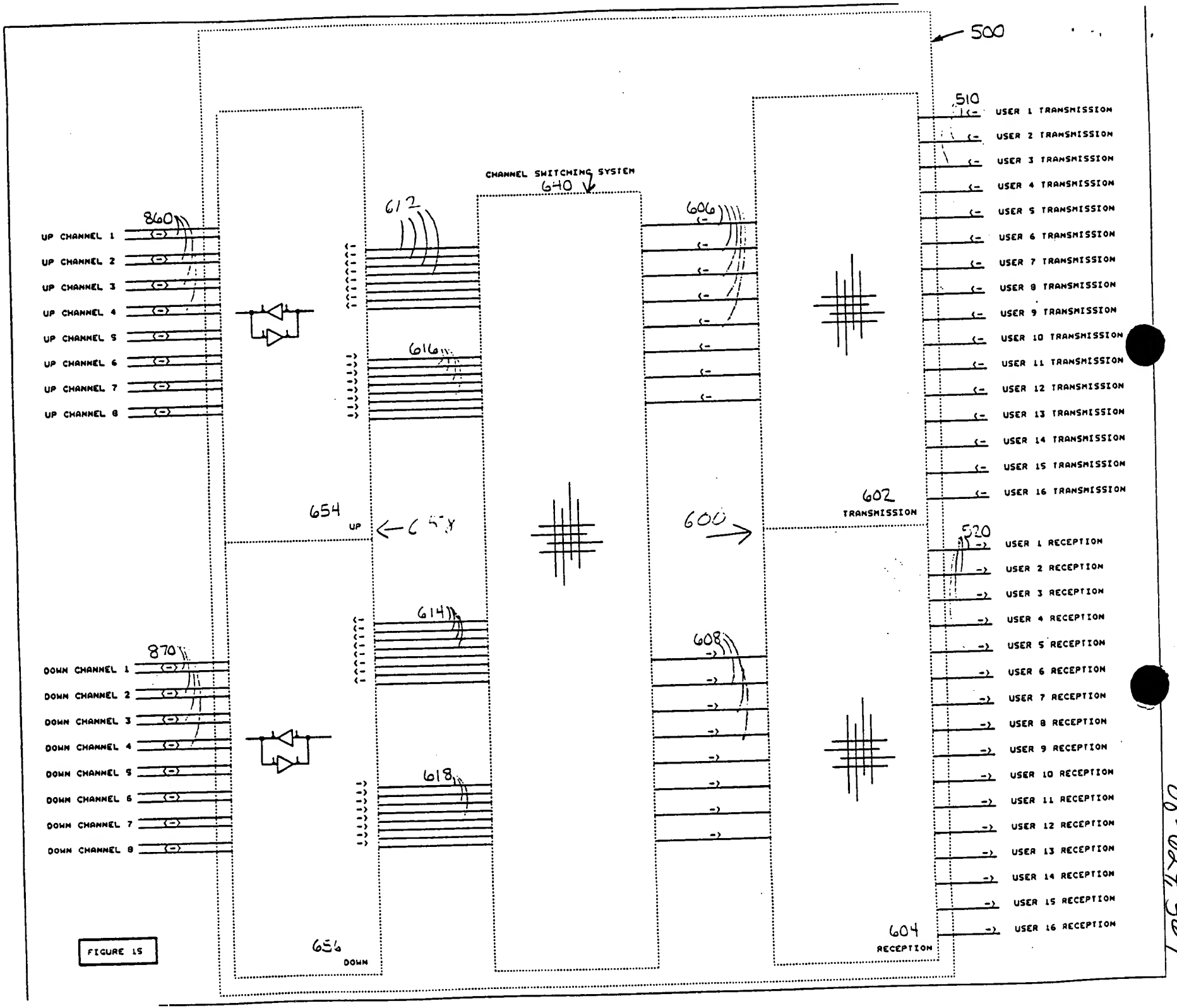
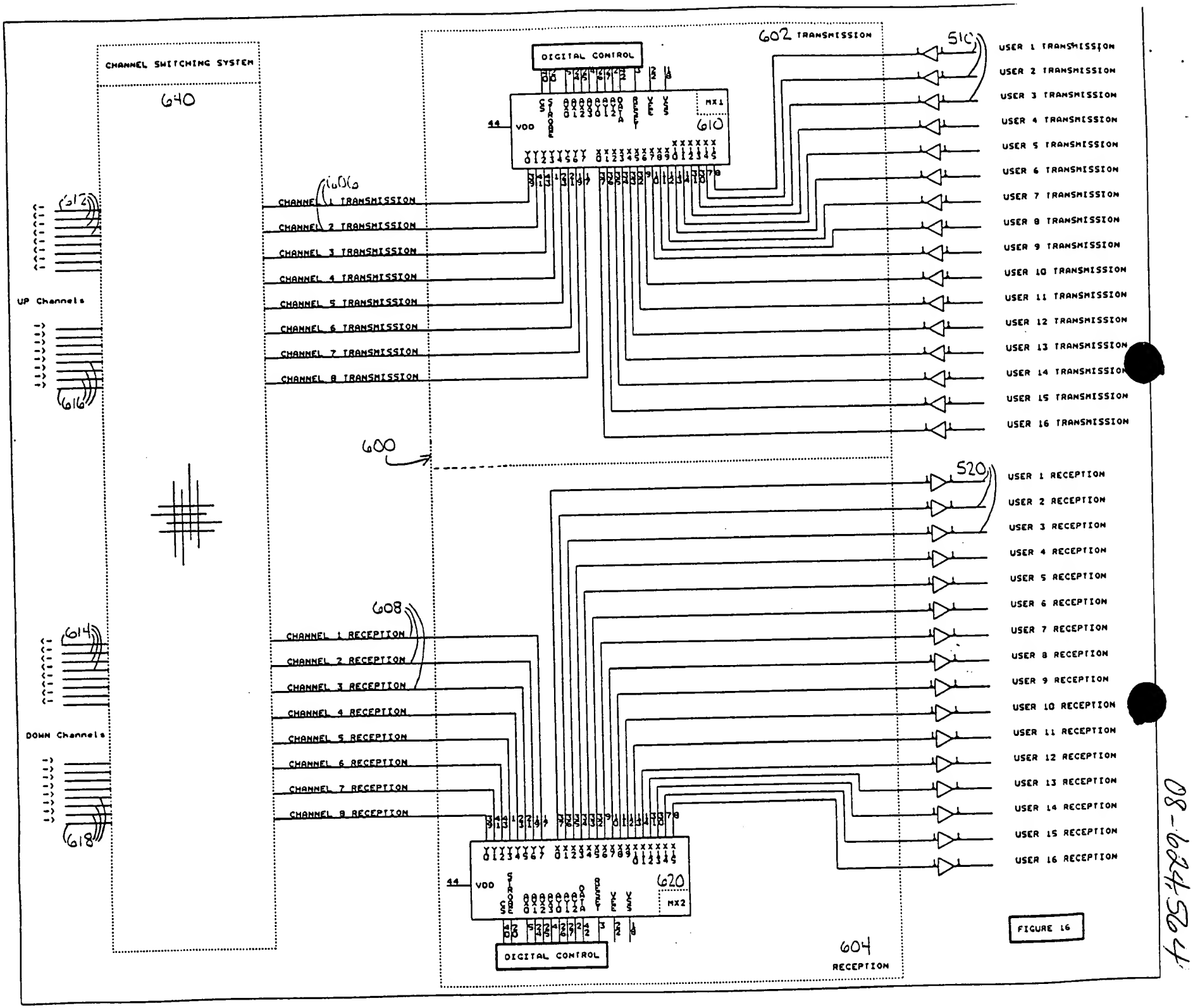
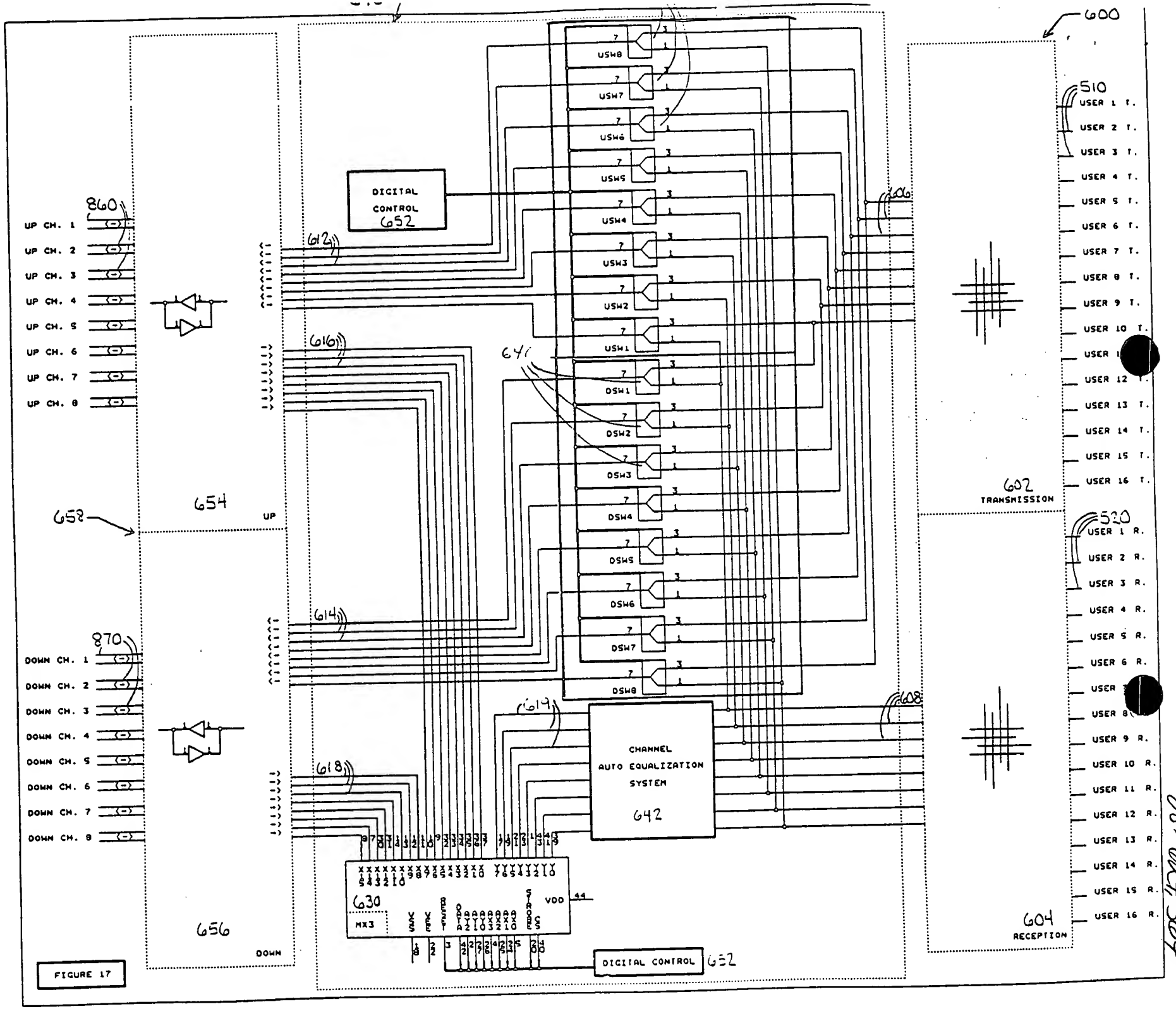


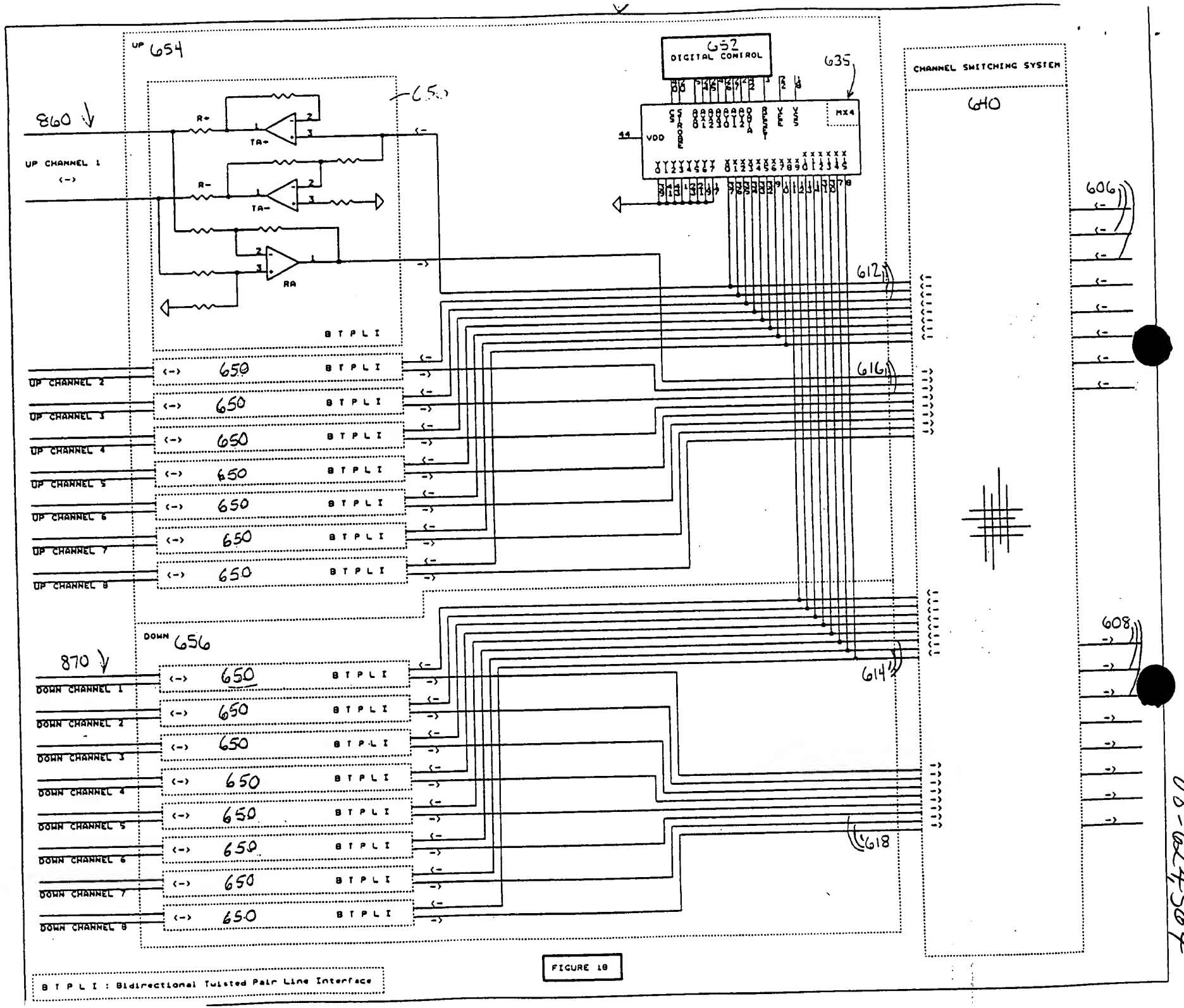
FIGURE 15

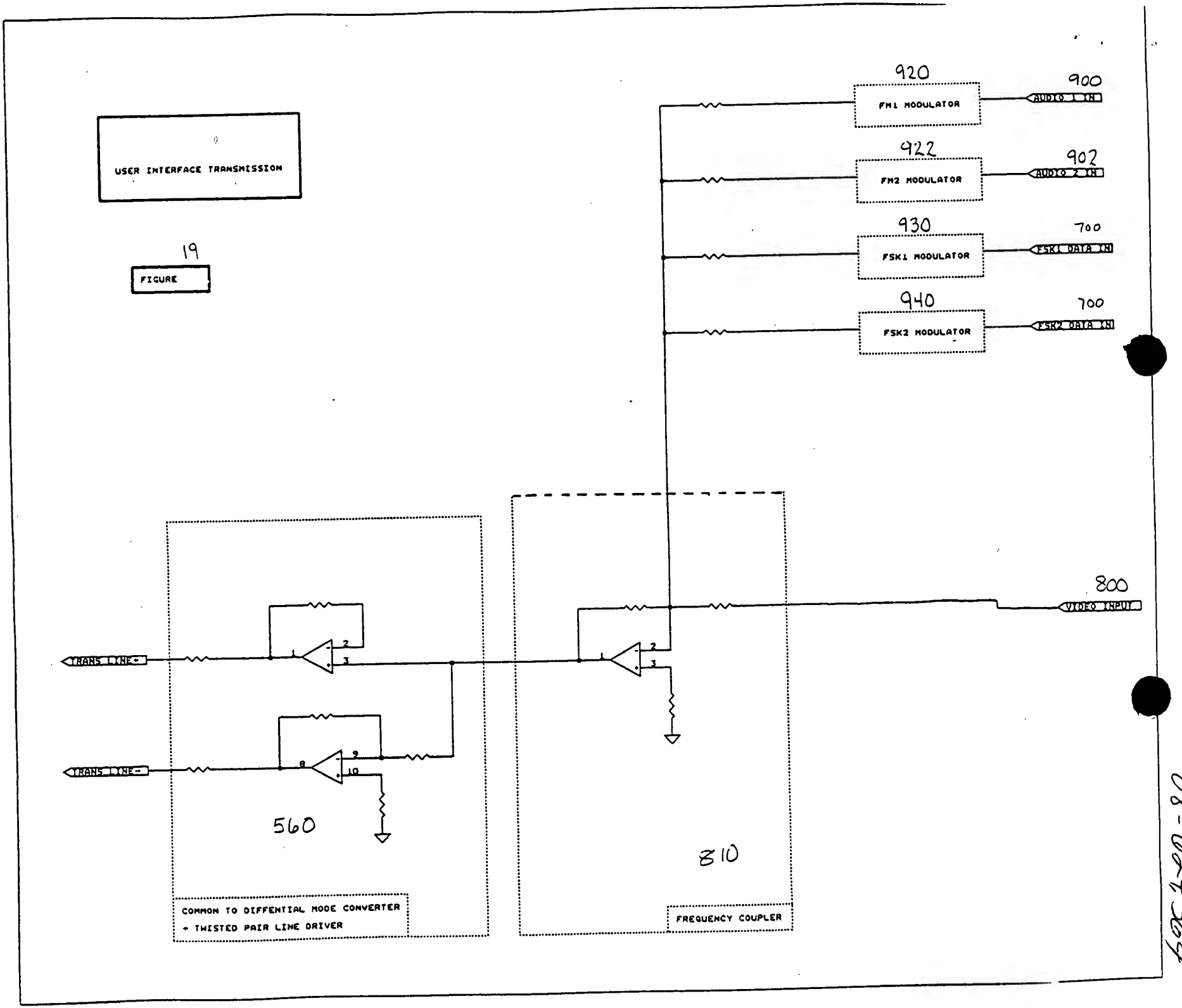
08-624,504

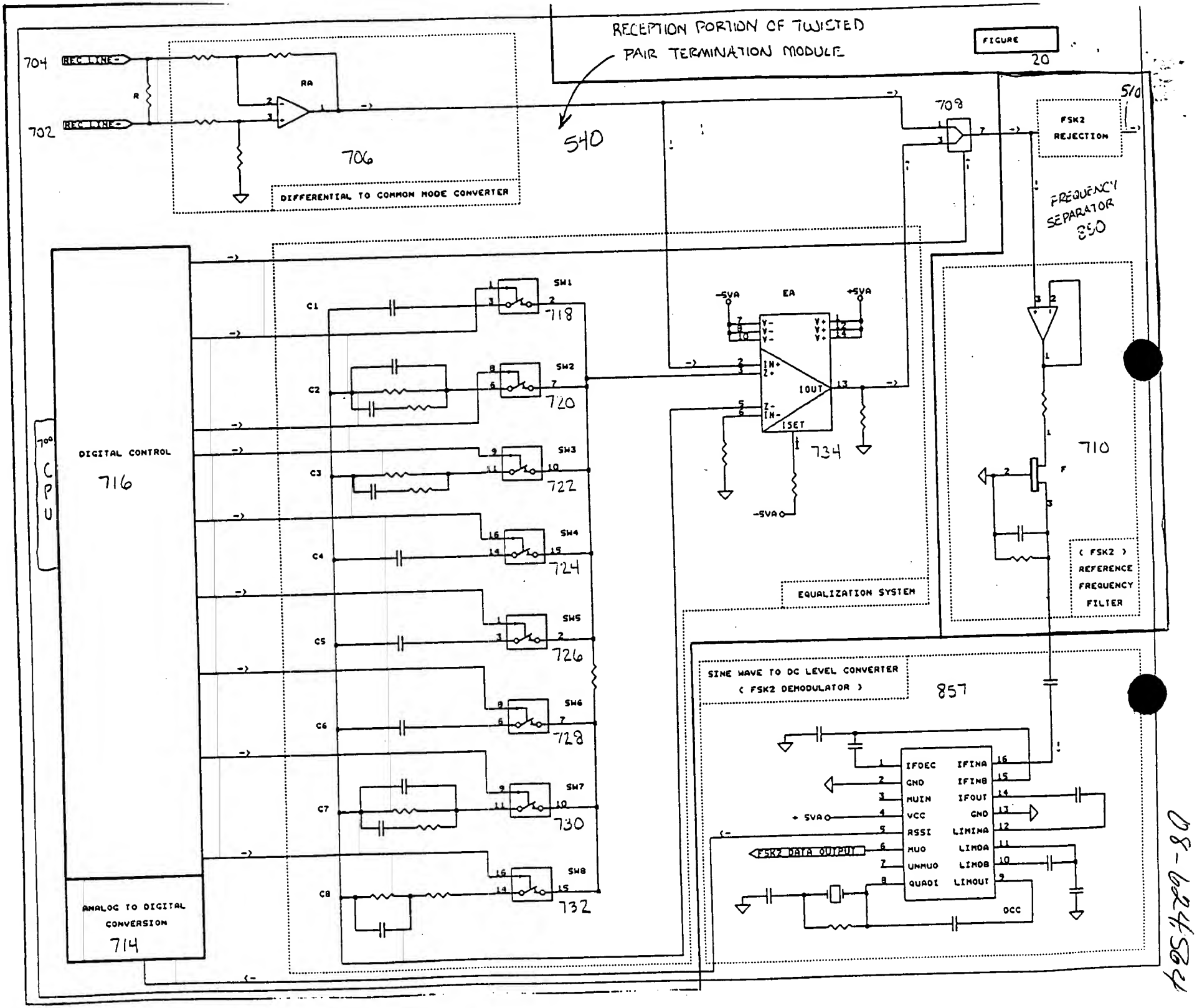

CHANNEL SWITCHING SYSTEM
640
602 TRANSMISSION
DIGITAL CONTROL
MX1
610
VDD
44
612
UP Channels
616
CHANNEL 1 TRANSMISSION
CHANNEL 2 TRANSMISSION
CHANNEL 3 TRANSMISSION
CHANNEL 4 TRANSMISSION
CHANNEL 5 TRANSMISSION
CHANNEL 6 TRANSMISSION
CHANNEL 7 TRANSMISSION
CHANNEL 8 TRANSMISSION
606
510
USER 1 TRANSMISSION
USER 2 TRANSMISSION
USER 3 TRANSMISSION
USER 4 TRANSMISSION
USER 5 TRANSMISSION
USER 6 TRANSMISSION
USER 7 TRANSMISSION
USER 8 TRANSMISSION
USER 9 TRANSMISSION
USER 10 TRANSMISSION
USER 11 TRANSMISSION
USER 12 TRANSMISSION
USER 13 TRANSMISSION
USER 14 TRANSMISSION
USER 15 TRANSMISSION
USER 16 TRANSMISSION
600
520
USER 1 RECEPTION
USER 2 RECEPTION
USER 3 RECEPTION
USER 4 RECEPTION
USER 5 RECEPTION
USER 6 RECEPTION
USER 7 RECEPTION
USER 8 RECEPTION
USER 9 RECEPTION
USER 10 RECEPTION
USER 11 RECEPTION
USER 12 RECEPTION
USER 13 RECEPTION
USER 14 RECEPTION
USER 15 RECEPTION
USER 16 RECEPTION
608
614
DOWN Channels
618
CHANNEL 1 RECEPTION
CHANNEL 2 RECEPTION
CHANNEL 3 RECEPTION
CHANNEL 4 RECEPTION
CHANNEL 5 RECEPTION
CHANNEL 6 RECEPTION
CHANNEL 7 RECEPTION
CHANNEL 8 RECEPTION
620
MX2
VDD
44
DIGITAL CONTROL
604
RECEPTION
FIGURE 16

08-6247.04


600
510
USER 1 T.
USER 2 T.
USER 3 T.
USER 4 T.
USER 5 T.
USER 6 T.
USER 7 T.
USER 8 T.
USER 9 T.
USER 10 T.
USER 11 T.
USER 12 T.
USER 13 T.
USER 14 T.
USER 15 T.
USER 16 T.
602
TRANSMISSION
520
USER 1 R.
USER 2 R.
USER 3 R.
USER 4 R.
USER 5 R.
USER 6 R.
USER 7 R.
USER 8 R.
USER 9 R.
USER 10 R.
USER 11 R.
USER 12 R.
USER 13 R.
USER 14 R.
USER 15 R.
USER 16 R.
604
RECEPTION
606
608
DIGITAL CONTROL
652
612
616
614
618
641
USW8
USW7
USW6
USW5
USW4
USW3
USW2
USW1
DSW1
DSW2
DSW3
DSW4
DSW5
DSW6
DSW7
DSW8
619
CHANNEL
AUTO EQUALIZATION
SYSTEM
642
860
UP CH. 1
UP CH. 2
UP CH. 3
UP CH. 4
UP CH. 5
UP CH. 6
UP CH. 7
UP CH. 8
654
UP
658
870
DOWN CH. 1
DOWN CH. 2
DOWN CH. 3
DOWN CH. 4
DOWN CH. 5
DOWN CH. 6
DOWN CH. 7
DOWN CH. 8
656
DOWN
630
MX3
VDD
44
DIGITAL CONTROL
632
FIGURE 17
08-6645804


UP 654
652
DIGITAL CONTROL
635
CHANNEL SWITCHING SYSTEM
640
860
UP CHANNEL 1
R-
TA-
RA
BTPLI
650
UP CHANNEL 2
UP CHANNEL 3
UP CHANNEL 4
UP CHANNEL 5
UP CHANNEL 6
UP CHANNEL 7
UP CHANNEL 8
DOWN 656
870
DOWN CHANNEL 1
DOWN CHANNEL 2
DOWN CHANNEL 3
DOWN CHANNEL 4
DOWN CHANNEL 5
DOWN CHANNEL 6
DOWN CHANNEL 7
DOWN CHANNEL 8
606
608
612
616
614
618
BTPLI : Bidirectional Twisted Pair Line Interface
FIGURE 18
08-6247847


USER INTERFACE TRANSMISSION
19
FIGURE
920
FM1 MODULATOR
900
AUDIO 1 IN
922
FM2 MODULATOR
902
AUDIO 2 IN
930
FSK1 MODULATOR
700
FSK1 DATA IN
940
FSK2 MODULATOR
700
FSK2 DATA IN
800
VIDEO INPUT
TRANS LINE +
TRANS LINE -
560
COMMON TO DIFFENTIAL MODE CONVERTER
+ TWISTED PAIR LINE DRIVER
810
FREQUENCY COUPLER


RECEPTION PORTION OF TWISTED PAIR TERMINATION MODULE
FIGURE 20
540
704
REC LINE +
702
REC LINE -
R
RA
706
DIFFERENTIAL TO COMMON MODE CONVERTER
708
510
FSK2 REJECTION
FREQUENCY SEPARATOR 850
700
CPU
DIGITAL CONTROL
716
ANALOG TO DIGITAL CONVERSION
714
SW1
C1
718
SW2
C2
720
SW3
C3
722
SW4
C4
724
SW5
C5
726
SW6
C6
728
SW7
C7
730
SW8
C8
732
-SVA
EA
+SVA
IOUT
ISET
734
710
F
(FSK2) REFERENCE FREQUENCY FILTER
EQUALIZATION SYSTEM
SINE WAVE TO DC LEVEL CONVERTER
(FSK2 DEMODULATOR)
857
IFOEC
GND
MUIN
VCC
RSSI
MUO
UNMUO
QUADI
IFINA
IFINB
IFOUT
GND
LIMINA
LIMOA
LIMOB
LIMOUT
DCC
+ SVA
FSK2 DATA OUTPUT

08-6245824

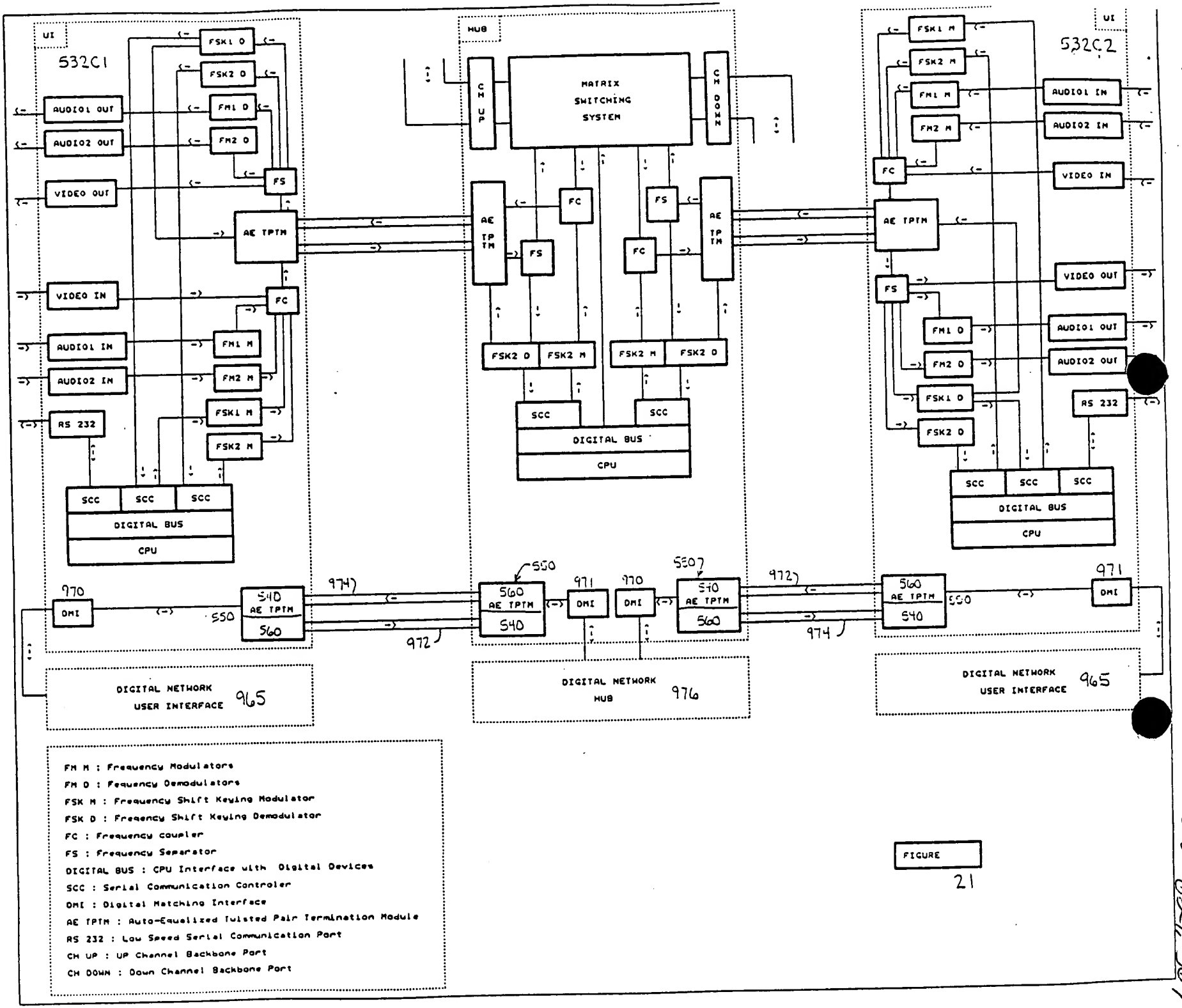
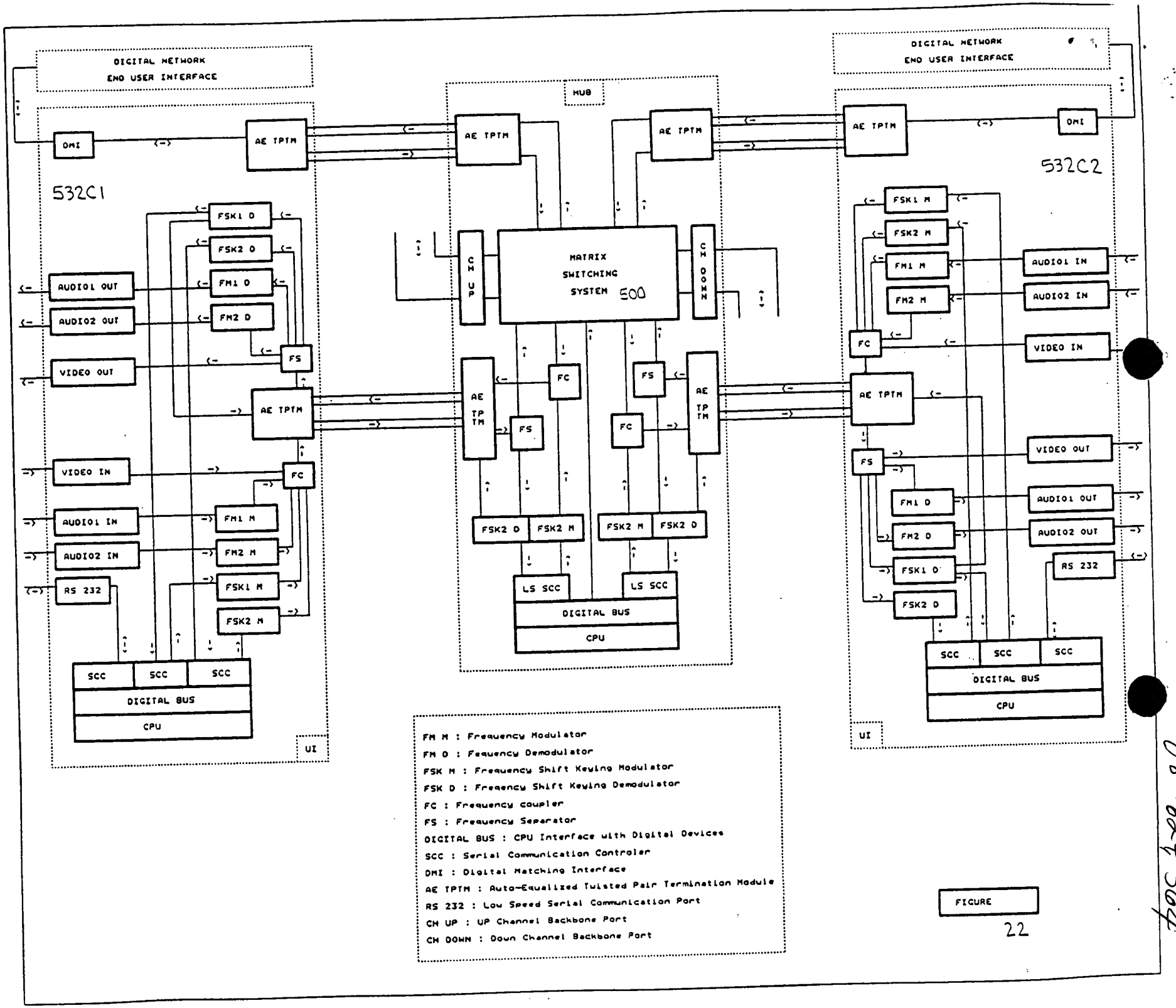


FIGURE 21

08-624,564


DIGITAL NETWORK
END USER INTERFACE
DMI
AE TPTM
532C1
FSK1 D
FSK2 D
FM1 D
FM2 D
FS
AUDIO1 OUT
AUDIO2 OUT
VIDEO OUT
AE TPTM
VIDEO IN
FC
AUDIO1 IN
AUDIO2 IN
RS 232
FM1 M
FM2 M
FSK1 M
FSK2 M
SCC
SCC
SCC
DIGITAL BUS
CPU
UI
HUB
AE TPTM
AE TPTM
CH UP
MATRIX
SWITCHING
SYSTEM 500
CH DOWN
AE TP TM
FC
FS
FS
FC
AE TP TM
FSK2 D
FSK2 M
FSK2 M
FSK2 D
LS SCC
LS SCC
DIGITAL BUS
CPU
DIGITAL NETWORK
END USER INTERFACE
AE TPTM
DMI
532C2
FSK1 M
FSK2 M
FM1 M
FM2 M
AUDIO1 IN
AUDIO2 IN
FC
VIDEO IN
AE TPTM
FS
VIDEO OUT
FM1 D
AUDIO1 OUT
FM2 D
AUDIO2 OUT
FSK1 D
RS 232
FSK2 D
SCC
SCC
SCC
DIGITAL BUS
CPU
UI
FM M : Frequency Modulator
FM D : Fequency Demodulator
FSK M : Frequency Shift Keying Modulator
FSK D : Freqency Shift Keying Demodulator
FC : Frequency Coupler
FS : Frequency Seperator
DIGITAL BUS : CPU Interface with Digital Devices
SCC : Serial Communication Controler
DMI : Digital Matching Interface
AE TPTM : Auto-Equalized Twisted Pair Termination Module
RS 232 : Low Speed Serial Communication Port
CH UP : UP Channel Backbone Port
CH DOWN : Down Channel Backbone Port
FIGURE
22
08-624 SD4

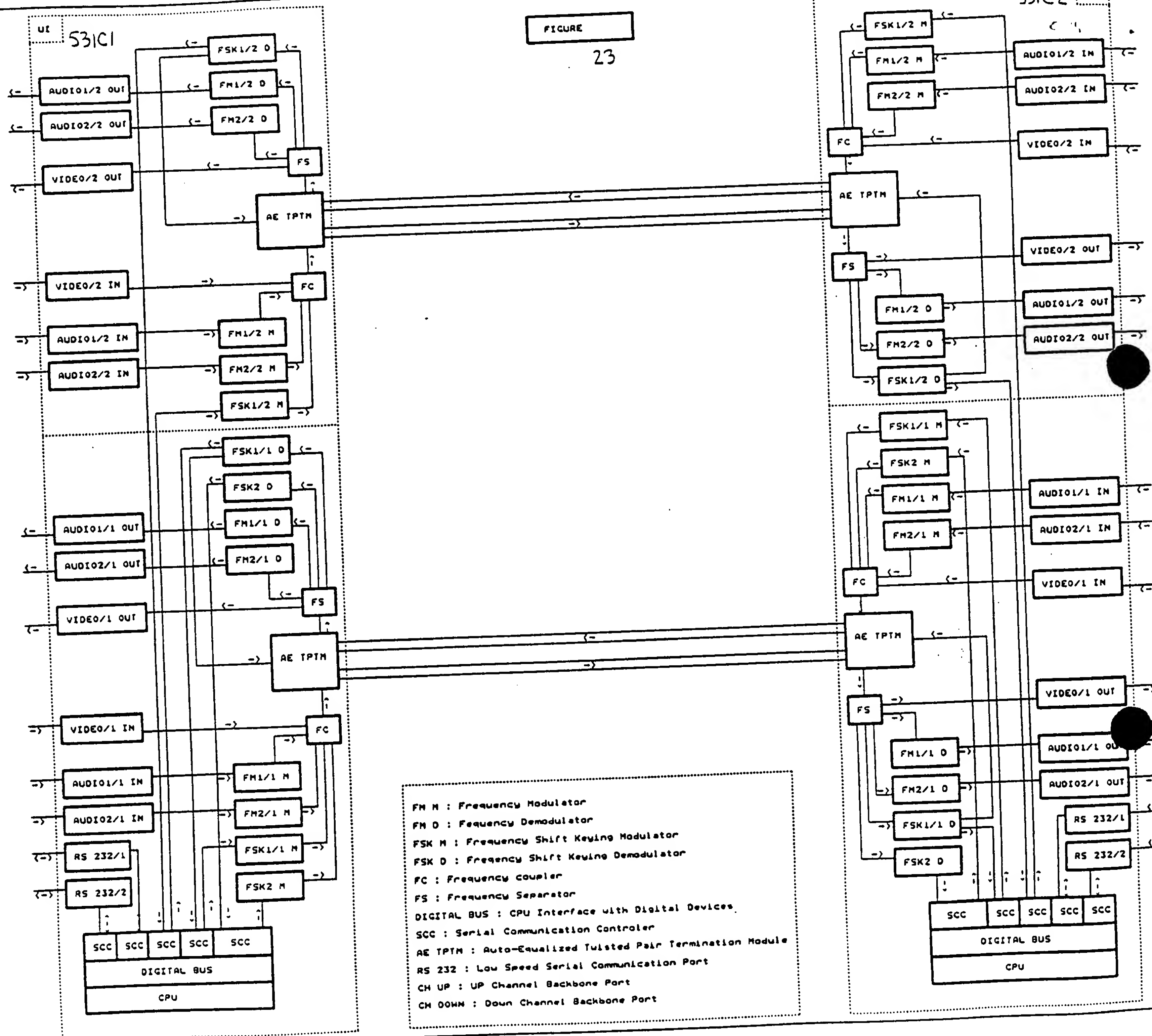
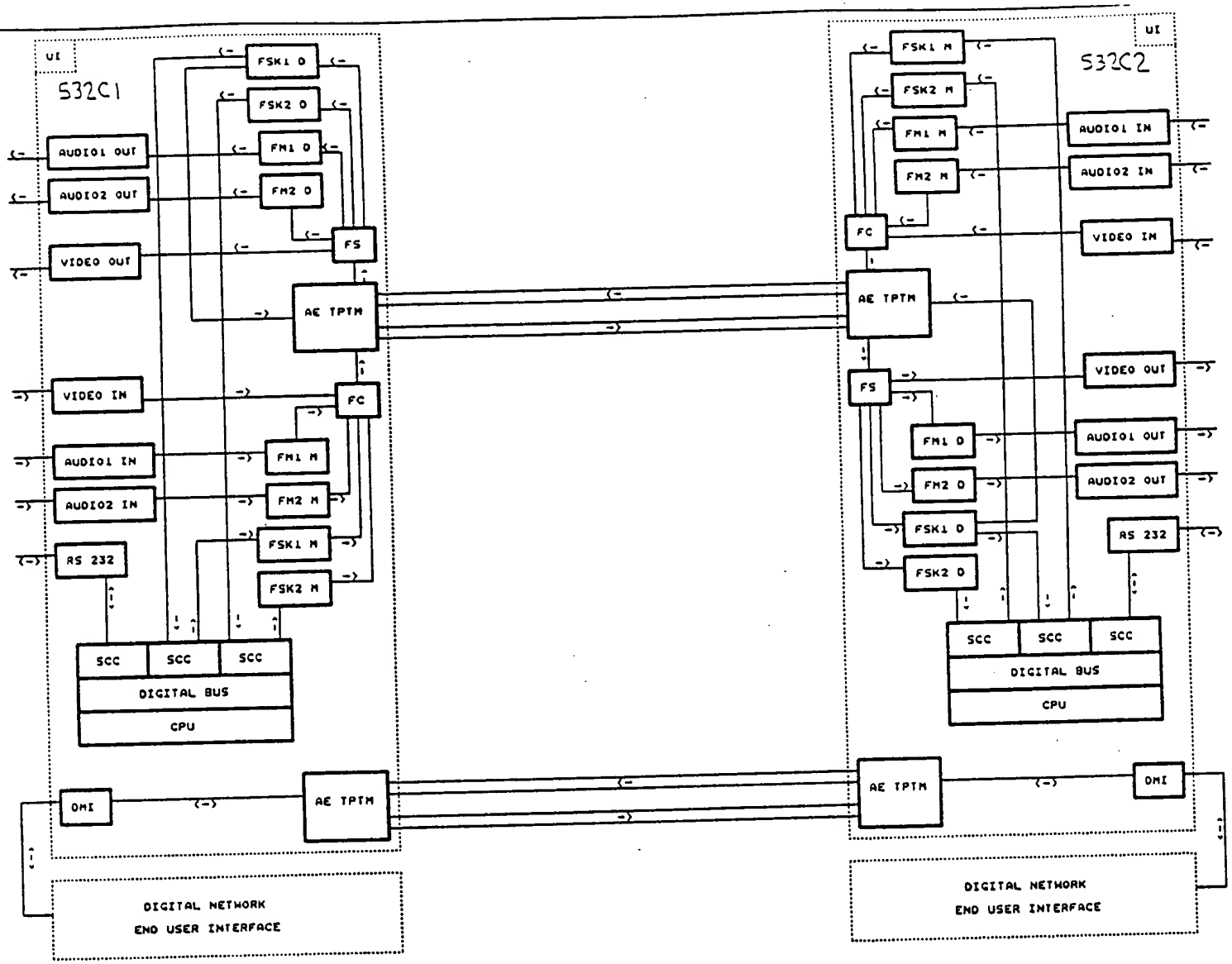


FIGURE 23

FM M : Frequency Modulator
FM D : Fequency Demodulator
FSK M : Frequency Shift Keying Modulator
FSK D : Freqency Shift Keying Demodulator
FC : Frequency coupler
FS : Frequency Separator
DIGITAL BUS : CPU Interface with Digital Devices
SCC : Serial Communication Controler
AE TPTM : Auto-Equalized Twisted Pair Termination Module
RS 232 : Low Speed Serial Communication Port
CH UP : UP Channel Backbone Port
CH DOWN : Down Channel Backbone Port

08-624564



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FSK D : Freqency Shift Keying Demodulator
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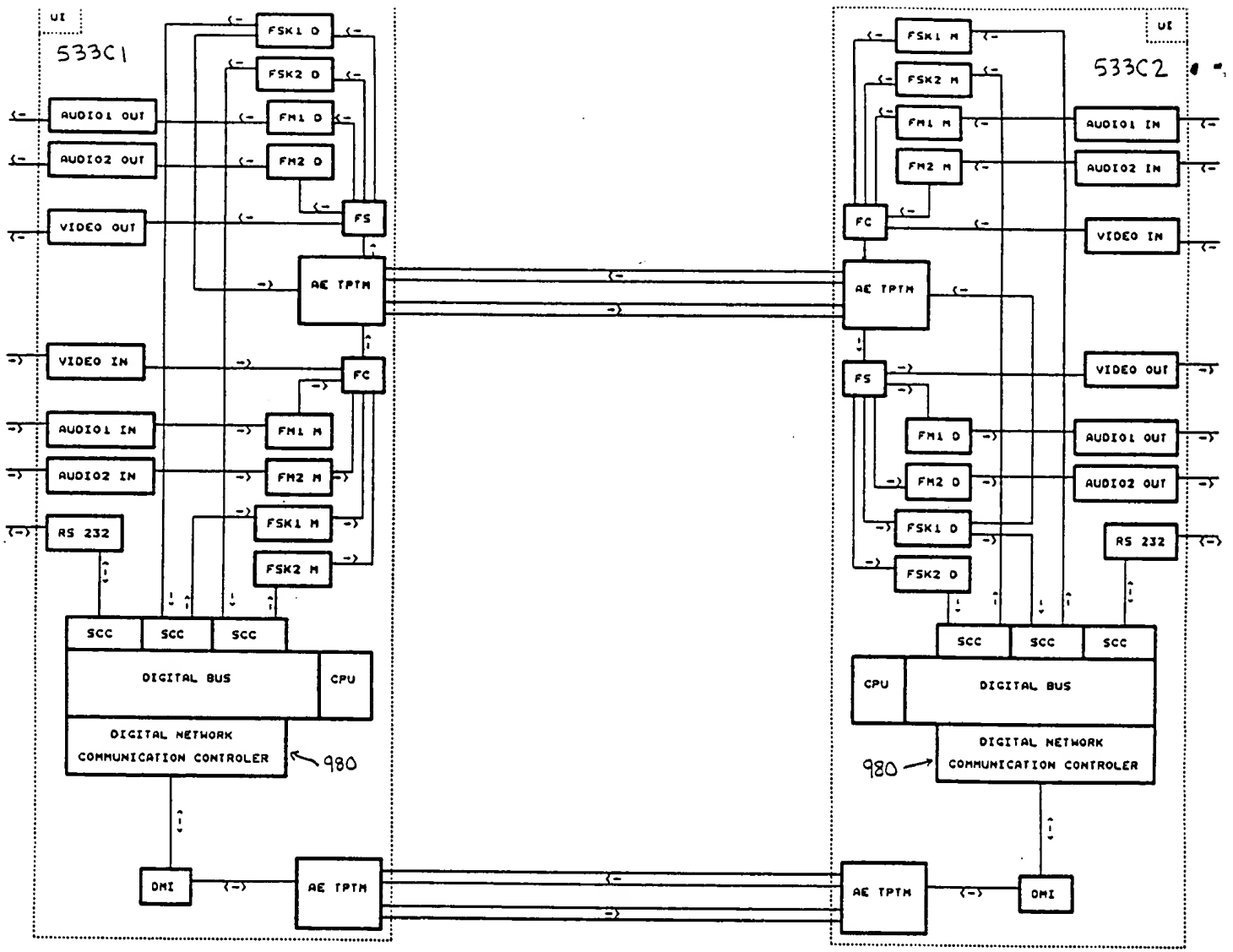
FS : Frequency Separator
DIGITAL BUS : CPU Interface with Digital Devices
SCC : Serial Communication Controler
DMI : Digital Matching Interface
AE TPTM : Auto-Equalized Twisted Pair Termination Module
RS 232 : Low Speed Serial Communication Port
CH UP : UP Channel Backbone Port
CH DOWN : Down Channel Backbone Port

FIGURE

24

08-624524



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CH DOWN : Down Channel Backbone Port

FIGURE 25